

REMARKS

The Official Action of 27 December 2007 has been carefully considered and reconsideration of the application as amended is respectfully requested.

Claim 2 has been amended to remove the basis for the rejection under 35 USC 112, second paragraph appearing on page 2 of the Official Action. Support for the amendment appears in the specification as filed at page 1, lines 30-32; page 4, line 2 and original claim 2.

Claim 1 has been amended with the incorporation of recitations formerly in claims 6 and 7. Other claims have been amended to make changes of a formal nature without narrowing the scope thereof.

Claims 1-3, 5, and 8-10 stand rejected under 35 USC 103(a) as allegedly being unpatentable over MacDowall. Claims 1, 5-10, 12 and 13 stand rejected under 35 USC 103(a) as allegedly being unpatentable over Otowa. Claims 1-13 stand rejected under 35 USC 103(a) as allegedly being unpatentable over Derbyshire. Applicants respectfully traverse these rejections.

The claimed invention is based at least in part upon Applicants' discovery that, by providing pretreatment steps to obtain a certain coconut shell precursor structure and selecting an appropriate processing route and conditions, it is possible to obtain a high surface area carbon that is useful for fuel cells and ultra-capacitor electrodes. As would be appreciated by those of skill in the art from the

application as filed, the properties of the activated carbon obtained by the claimed process is determined both by (a) the processing route and conditions and (b) the coconut precursor structure formed in the claimed pretreatment steps. See Derbyshire et al at column 2, lines 13-15 ("While the properties of activated carbons are influenced to some extent by the processing route and conditions, the precursor structure is the single most determinant factor."). As next discussed, none of the cited references shows or suggests the claimed processing route and conditions or the precursor structure that is obtained by the initial treatment steps as claimed.

MacDowall

MacDowall discloses a process in a sequence as follows: reducing particle size; treating with H_3PO_4 ; mechanical mixing; pellitizing by a rotary pellitizer; heating; carbonization and activation at 400-500°C; washing; drying and classification according to pellet size. The granular activated carbon obtained is useful for the purification of liquids and gases.

MacDowall does not show or suggest the claimed process steps and conditions, including carbonization at 300-400°C and activation at 600-700°C in an inert or oxidizing gas, as would be required to prepare the claimed activated carbon with high surface area and suitable for ultracapacitor and fuel electrode use. Moreover, MacDowall also does not show carbonization in an inert gas. (The Examiner's contention that carbonization implies an inert atmosphere is respectfully traversed and, if the Examiner persists in this contention, he is

respectfully requested to supply a reference in support- -see MPEP 2144.03.)

Further, MacDowall does not teach the claimed steps of pretreatment of the coconut shells or the result-effective nature thereof. See Derbyshire et al at column 2, lines 13-15.

Applicants respectfully submit that, in the absence from the reference of any teaching of the claimed parameters and pretreatment steps, there can be no articulated reasoning with rational underpinning to provide even a *prima facie* case of obviousness for the invention as claimed. See MPEP 2142. With particular respect to the Examiner's contention that it would have been obvious to optimize process parameters, Applicants respectfully note that any optimization of the parameters in the reference process would be directed toward the preparation of activated carbon for a different use (the purification of liquids and gases) than the activated carbon prepared by the claimed process (use in ultra-capacitors and fuel electrodes). There is nothing to show or suggest that an optimization of parameters for the use described in the reference would result in the claimed parameters that are designed to prepare activated carbon for a completely different use.

Otowa

Otowa teaches melting KOH by heating at 200-250°C and mixing with coconut shell char, then heating at a temperature not lower than 480°C, and preferably in the range of 500-900°C, with stirring. The reference teaches that

carbonization should not be performed at temperatures lower than 480°C and that melting of KOH is the most integral part of the process. The carbon source prepared in Otowa is useful for purification of water, gas and air and chemical recovery.

Otowa thus teaches away from the claimed process parameters, including drying at 100-200°C, carbonizing in inert atmosphere at 300-400°C and further heating at 500-800°C. Moreover, in teaching that the KOH is melted before activation, Otowa teaches away from claimed steps of carbonizing and activating “a powder” as claimed. See MPEP 2143.01(VI) (“If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.”). Further, Otowa does not show or suggest the claimed pretreatment steps or the result-effective nature thereof. See Derbyshire et al at column 2, lines 13-15.

Applicants respectfully submit that, in the absence from the reference of any teaching of the claimed parameters and pretreatment steps, there can be no articulated reasoning with rational underpinning to provide even a *prima facie* case of obviousness for the invention as claimed. See MPEP 2142. With particular respect to the Examiner’s contention that it would have been obvious to optimize process parameters, Applicants respectfully note that any optimization of the parameters in the reference process would be directed toward the preparation of activated carbon for a different use (the purification of liquids and

gases) than the activated carbon prepared by the claimed process (use in ultra-capacitors and fuel electrodes). There is nothing to show or suggest that an optimization of parameters for the use described in the reference would result in the claimed parameters that are designed to prepare activated carbon for a completely different use.

Derbyshire et al

Derbyshire et al disclose a process of reacting a biomass feedstock (e.g., wood, coconut shell, fruit pits, peats, lignites, etc.) with a processing agent in the presence of an activating agent, heating in the absence of an inert atmosphere, then leaching (with distilled water), and drying to prepare a carbon source for purification of water, gas and air and for chemical recovery.

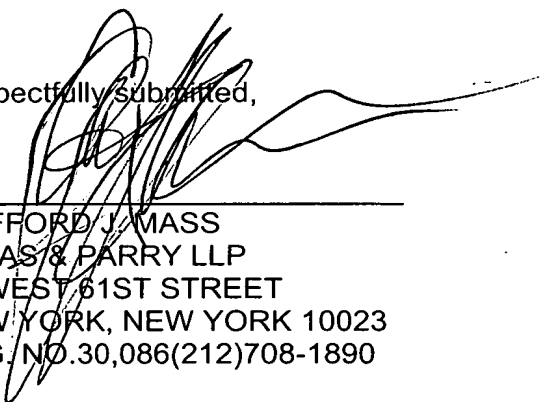
As acknowledged by the Examiner, Derbyshire et al do not teach the claimed pretreatment of coconut shells or the claimed heating at three (3) different temperatures as claimed. Although the Examiner contends that the pretreatment is an obvious expedient, this contention is respectfully untenable in light of the reference's teaching of the criticality of the precursor structure. See Derbyshire et al at column 2, lines 13-15 ("...the precursor structure is the single most determinant factor."). Moreover, with respect to the Examiner's contention that it would have been obvious to optimize the process parameters, Applicants respectfully note that any optimization of the parameters in the reference process would be directed toward the preparation of activated carbon for a different use (the purification of liquids and gases) than the activated carbon prepared by the

claimed process (use in ultra-capacitors and fuel electrodes). There is nothing to show or suggest that an optimization of parameters for the use described in the reference would result in the claimed parameters that are designed to prepare activated carbon for a completely different use.

Applicants respectfully submit that, in the absence from the reference of any teaching of the claimed parameters and pretreatment steps, there can be no articulated reasoning with rational underpinning to provide even a *prima facie* case of obviousness for the invention as claimed. See MPEP 2142.

In view of the above, Applicants respectfully submit that all rejections and objections of record have been overcome and that the application is now in allowable form. An early notice of allowance is earnestly solicited and is believed to be fully warranted.

Respectfully Submitted,



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